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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/058,216	01/29/2002	Dimitris K. Agrafiotis	044988.4668	3315

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Vicki G. Norton
PILLSBURY WINTHROP LLP
11682 El Camino Real Suite 100
San Diego, CA 92130-2092

EXAMINER	
MAHATAN, CHANNING	
ART UNIT	PAPER NUMBER
1631	

DATE MAILED: 05/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/058,216	AGRAFIOTIS ET AL.	
	Examiner	Art Unit	
	Channing S Mahatan	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33 and 36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33 and 36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *43 Sheets*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

APPLICANTS' ELECTION

Applicants' election with traverse of Group I (claims 1-33 and 36; drawn to a method, system, and computer program product for generating coordinates of corresponding building blocks) in the response, filed 08 February 2004, is acknowledged. The traversal is on the ground(s) that "consideration of these groups together would not impose an undue burden on the Examiner. This is not found persuasive because the "Election/Restrictions" requirement previously set forth indicated Groups I and II have different functions, different effects (i.e. different results), and different modes of operation. While it is acknowledged that Groups I and II are classified in the same class and subclass; classification within the same class and subclass does not preclude each Group from a required non-coextensive non-patent literature search (i.e. the search required for Group I is not required for Group II). Applicants are directed to the "Election/Restriction Requirement" indicating reasons for distinctness between the identified groups.

The requirement is still deemed proper and is therefore made FINAL.

With respect to Applicants' remarks regarding the Office Communication (mailed 23 January 2004) Applicants are to note claims 34, 35, and 37 were cancelled (amendment in the Applicants' response filed 15 January 2004) and therefore require a listing of claims.

CLAIMS UNDER EXAMINATION

Claims herein under examination are claims 1-33 and 36. Claims 34, 35, and 37 have been cancelled.

Claims Rejected Under 35 U.S.C. § 112 2nd Paragraph

The following is a quotation of the second paragraph of 35 U.S.C. § 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-33 and 36 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

VAGUE AND INDEFINITE

Claims 1, 14, 24 and all claims dependent therefrom are indefinite due to the lack of clarity of the claim language failing to agree with the preamble. The preamble states the following "...wherein the distances between the coordinates represent relationships between the products" (claim 1)/"...wherein the distances between the coordinates represent similarity/dissimilarity of the products" (claims 14 and 24). However, absent from the body of the instants claim(s) is any indication of said distances and that said distances between coordinates represent relationships or similarity/dissimilarity among the products. It is unclear if such language from the preamble is intended to be part of the body of the claim. Clarification of the metes and bounds of the claim is requested via clearer claim wording.

Claims 1, 14, 24, and all claims dependent therefrom recite the language "whereby the mapping function *f* is useful for generating coordinates for additional products in the combinatorial library from building block features associated with the additional products" which is vague and indefinite. First, the instant claims do not set forth any steps involved for the use of the mapping function f to generate coordinates for additional products in the combinatorial library and therefore, it is unclear what method/process Applicants' are intending to encompass

(absent are active/positive steps for indicating how the mapping function *f* is to be practiced). Second, the term "useful" implies some criteria/parameter that establishes something as being "useful". Applicants' can resolve this issue by particularly pointing out the criteria(s)/parameter(s) that established something as being "useful" in the context of the instantly claimed invention. Third, unclear is whether the mapping function *f* is solely responsible for the generation of coordinates or is one step/function out of many for the generation of coordinates. Finally, it is unclear if the generated coordinates is regarded as "mapping coordinates" (as previously recited in the body of the instant claims) or directed to some other coordinates (i.e. atomic). Clarification of the metes and bounds, via clearer claim language, is requested.

Claims 4, 16, and 26 recite the limitation "more representative" which is vague and indefinite. The above limitation implies some criteria as being indicative of being "more representative" of the relationship of between the products. For instance, an initial relationship would first need to be established (serving as a reference point) followed by a criteria(s) that would indicate that something is "more representative" over that of something being "equally representative" or "less representative". Clarification of the metes and bounds, via clearer claim language, is requested.

Claims 4, 16, and 26 recite the limitation "a stop criterion is obtained" which is vague and indefinite. It is unclear what defines the "stop criterion", thereby, indicating that it is indeed obtained. Applicants' can resolve this issue by particularly pointing out what defines the stop criterion. Clarification of the metes and bounds, via clearer claim language, is requested.

Claims 10, 11, 20, 21, 30, and 31 recite the limitation "fragment of reagents"(claims 10, 20, 30)/"modified fragments of reagents" which is vague and indefinite. The term "fragment" with regard to the reagents has varying interpretations and it is thus unclear what Applicants intend such language to encompass. For example, the "fragments of reagents" may imply a numerical value of the reagents (i.e. amount of reagent) or may imply a structural limitation of reagents. Further, the above indicate imply a range or criteria that would define what is considered to be a fragment(s) of the reagent(s). Clarification of the metes and bounds, via clearer claim language, is requested.

Claims 13, 23, and 33 recite the limitation "a set of specialized mapping functions f_1 through f_n" which is vague and indefinite. The term "specialized" implies particular parameters or criteria that is indicative of mapping functions to be "specialized" over that of mapping functions that are non-specialized. Applicants can resolve this issue by particularly pointing out the particular parameters or criteria that are considered to deemed mapping functions as "specialized". Clarification of the metes and bounds, via clearer claim language, is requested.

Claim 36 recites the limitation "until the distances between the products on the *m*-dimensional nonlinear map are representative of the similarity relationship between the products" which is vague and indefinite. The language "representative" in the context of the instant claim implies a point (i.e. until) at which the distances between the products on the *m*-dimensional nonlinear map is reached such that it is "representative" of the similarity relationship between the products. Applicants can resolve this issue by particular pointing out what established the point that is considered to be "representative". Clarification of the metes and bounds, via clearer claim language, is requested.

Claims Rejected Under 35 U.S.C. § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-3, 5-9, 12, 14, 15, 17-19, 22, 24, 25, and 27-29, and 32 are rejected under 35 U.S.C. § 102(a) as being anticipated by Agrafiotis et al. (Nonlinear Mapping Networks. J. Chem. Inf. Comput. Sci. Nov.-Dec. 2000, Vol. 40, p.1356-1352).

Agrafiotis et al. describes an approach for analyzing and visualizing the relationships between objects in high-dimensional data sets by combining non-linear mapping techniques with feed-forward neural networks (i.e. supervised learning approach) to reduce the dimensionality of large data sets (claims 1, 14, and 24; Abstract; page 1358, left column, lines 5-9). The authors employ a classical algorithm to multi-dimensionally scale a small random sample (i.e. subset) which reflects the overall structure of the data, and then "learns" the underlying (infers) non-linear transform (mapping function) using a multilayer neural network trained with a back-propagation algorithm (claims 12, 22, and 32; page 1358, right column, lines 27-32). After the neural network is trained it can be used in a feed-forward manner to project/output (generated coordinates) the remaining members of the population as well as new, unseen samples with minimal distortion (claims 2, 15, and 25; page 1358, right column, lines 32-35). The authors provide that for a non-linear projection/output from n to m dimensions, a standard three-layer neural network with n input (i.e. building blocks) and m output units (mapping coordinates) is employed, wherein each n-dimensional pattern is presented to the input layer, and its coordinates

on the non-linear map are obtained by the respective units in the output layer (claims 3, 16, and 25; page 1358, right column, lines 35-41; and Figure 1). Agrafiotis et al. provides an example of the described computational method in the field of combinatorial chemistry by utilizing a data set from a three-component combinatorial library wherein a small library of compounds, made of the principal components (i.e. reagents; building blocks) were used as input to the non-linear dimensionality reduction technique (claims 5-9, 17-19, and 27-29; pages 1360-1361, 'Diamine Data Set' section). The described method is performed within a computer (page 1362, right column, lines 28-36), and therefore would be encoded within the computer (i.e. hard drive) (claims 1, 14, and 24). Thus, Agrafiotis et al. anticipates the claimed invention.

For clarification of particular limitations within the claims the specification provides the following:

> "mapping coordinates" refers to the mapping coordinates of the library products...(page 12, paragraph [0038])
>
> "building blocks features" refers to the input features of the library building blocks (e.g. reagents, fragments of reagents, and/or modified fragments of reagents). (page 12, paragraph [0038]
>
> "A supervised machine learning approach is then employed to determine a functional relationship between the *n*-dimensional input and *m*-dimensional output vectors, and that functional relationship is recorded. Hereinafter, this functional relationship shall be referred to as a "mapping function". (page 4, paragraph [0007])

No Claims Are Allowed.

EXAMINER INFORMATION

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the

Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 C.F.R. § 1.6(d)). The CM1 Fax Center number is either (703) 872-9306.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Channing S. Mahatan whose telephone number is (571) 272-0717. The Examiner can normally be reached on M-F (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael P. Woodward, Ph.D., can be reached on (571) 272-0722.

Any inquiry of a general nature or relating to the status of this application should be directed to Legal Instruments Examiner, Tina M. Plunkett, whose telephone number is (571) 272-0549 or to the Technical Center receptionist whose telephone number is (703) 308-0196.

Date: April 30, 2004

Examiner Initials: CSM

Marianne P. Allen

MARIANNE P. ALLEN
PRIMARY EXAMINER 5/3/04

AU1631